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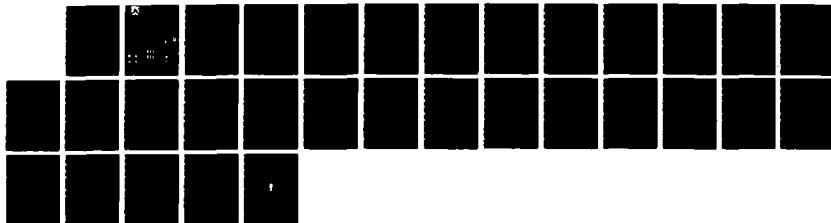
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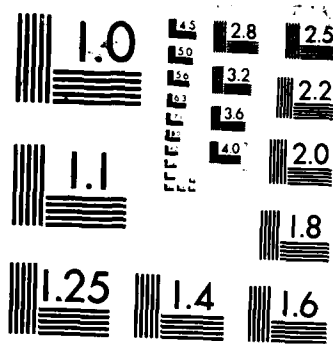
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## RESEARCH REPORT

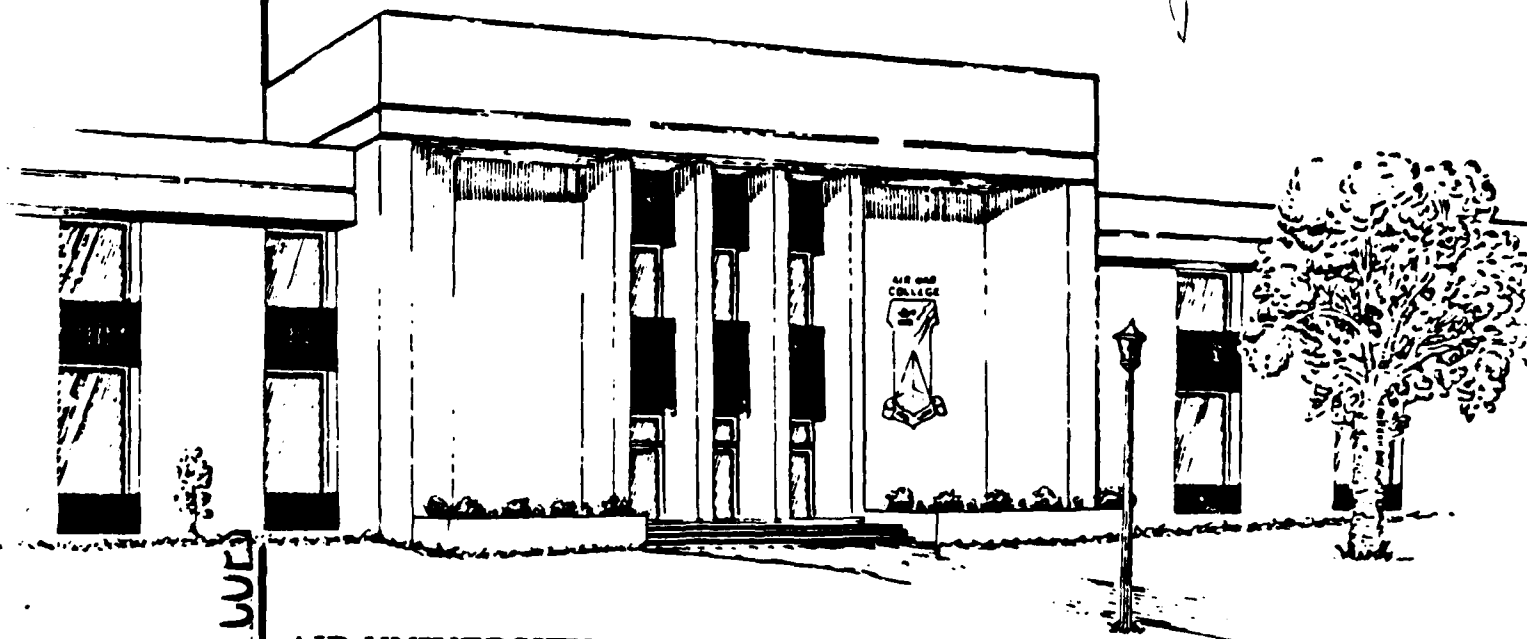
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LEADERSHIP: THE MISSING LINK IN MAINTENANCE OFFICER DEVELOPMENT

By LT COL DOUGLAS D. STORMO

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LEADERSHIP: THE MISSING LINK IN MAINTENANCE OFFICER DEVELOPMENT

by

Douglas D. Stormo  
Lieutenant Colonel, USAF

A RESEARCH REPORT SUBMITTED TO THE FACULTY  
IN  
FULFILLMENT OF THE RESEARCH  
REQUIREMENT

Research Advisor: Lieutenant Colonel John A. Brantner

MAXWELL AIR FORCE BASE, ALABAMA

MAY 1986

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AIR WAR COLLEGE RESEARCH REPORT ABSTRACT

TITLE: Leadership: The Missing Link in Maintenance Officer Development

AUTHOR: Douglas D. Stormo, Lieutenant Colonel, USAF

A brief review of the evolution of aircraft maintenance coupled with the comments of some senior leaders and junior aircraft/munitions maintenance officers highlighting a persistent concern for improved maintenance officer development. The nature of the problem is discussed with an explanation of some of the current factors contributing to the perceived inadequacy of career development training. Mentor responsibilities are highlighted in a composite review of recent studies and leadership/management publications. The recommended solution to the present training shortcomings involves an active senior maintenance officer mentor/coach relationship with assigned junior officers. A renewed effort is called for with emphasis on transferring mentor experience along with dynamic leadership and maintenance management principles.

## BIOGRAPHICAL SKETCH

Lieutenant Colonel Douglas D. Stormo (M.S., Air Force Institute of Technology--School of Systems and Logistics) entered the Air Force as an Aircraft Maintenance Officer in 1967. With the exception of a career broadening assignment in Production Management at Defense Contract Administration Services Region--Chicago, he has devoted his entire career to aircraft maintenance. He has served in Air Defense Command, Alaskan Air Command and Pacific Air Forces in a variety of positions including Squadron Commander and Chief of Maintenance. His Professional Military Education includes Squadron Officers School by correspondence and Air Command and Staff College in residence. His technical logistics training includes the basic Aircraft Maintenance Officer Course, Maintenance Staff Officer Course, Advanced Production Management Course and Defense Procurement Management Course. Lieutenant Colonel Stormo is a graduate of the Air War College, class of 1986.

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## CHAPTER I

### INTRODUCTION

The need for maintenance officer training has been a consistent area of concern throughout the evolution of airpower. Formation of the Aeronautical Division of the United States Army Signal Corps on 1 August 1907 probably marked the conceptual beginning point. The Wright brothers and their peers during the early days of aircraft development were in many ways the ideal maintenance officer model. They designed, built, flew, modified, repaired and sustained the aircraft of their era. Obviously, there was a very close relationship between mechanic and pilot when aircraft were simple in design and equipped with only basic necessities for short flights. As aircraft became more complex, both pilot and mechanic became specialized. Lt Benjamin D. Foulois wrote the first regulation concerning airplane maintenance in 1911. History lists Lt. Foulois, F. D. Milling and H. H. Arnold as the forerunners of today's aircraft maintenance officer career field--of course their primary duty was flying. (27:5-8)

It is interesting to note that in some ways we have come full circle in the past 78 years. In August 1945, the Army published a regulation 65-1 called Combat Maintenance Procedures which had a familiar sound to the recent Tactical Air Forces maintenance thrust. The first decade of USAF

history reflected a period where each major command developed its own maintenance philosophy and procedures. In 1956, the first AFM 66-1 was published which provided for a centralized maintenance management system for all commands. By 1966, Tactical Air Command opted for a more decentralized system which aligned maintenance more with its supported operations squadron. However, by 1972, all commands were back under centralized AFM 66-1 maintenance because of training problems encountered in supporting two different concepts and perceived cost benefits to be gained under centralization. It soon became apparent that centralized maintenance did not provide the flexibility and greater productivity experienced under decentralized operations for tactical fighter units. Therefore, in 1977 the Air Staff allowed each major command to develop its own maintenance concept which brings us to where we were in the beginning. For those interested in more detail concerning the history of Aircraft Maintenance, I highly recommend reading Captain (now Lt Col) James N. Townsend's Air Command and Staff College report. (27)

The evolution of aircraft maintenance philosophy has been accompanied by great technological advancement in aircraft, support equipment and test and diagnostic equipment. Likewise, the training required and provided to maintain and manage an increasingly complex mix of weapon systems has undergone a blend of turmoil and change. Early

maintenance officers were primarily pilots and engineers who fully understood the machines they were supporting. The complexity of today's weapon systems is beyond such indepth understanding and requires generalist leadership and management of a mixture of specialists who are experts on their particular system components and may be familiar with the operation of associated systems.

The range of potential assignments further dilutes the expertise of individual maintenance officers. For every three CONUS assignments, there is one overseas assignment (most of which are fighter aircraft jobs). Rotating officers to fill long and short tour overseas positions by necessity keeps officers moving from one command to another and from one type of aircraft to another during their careers. For example, during my 19 year career I have direct experience on 12 different aircraft with indirect experience on 8 more. Therefore, maintenance officers must be very familiar with the technical aspects of basic systems which are common to all aircraft so they can quickly "specialize" on the unique systems and missions they encounter from one assignment to another.

Formal schooling can do a respectable job in providing general technical training and education on principles of management and leadership essential to long term success. However, the unique training requirements germane to each major command, as well as those encountered

as one moves from base to base and aircraft to aircraft can best be handled at unit level judging from our historical pattern of change. Each Major Air Command recently developed training programs for maintenance officers which reflect unit mission orientation or in modern management vernacular "the way we do things around here." Part of this training involves specific weapon system technical training which is taught by unit experts or Field Training Detachments. The balance covers policies, procedures, unit orientation and operational mission familiarization.

(2,19,25,26)

During the last ten years, senior leaders have struggled and experimented with the dilemma of how to best prepare and train maintenance officers for the challenge of today's peacetime training environment and the unknowns that will inevitably confront them during the next conflict or war. We have taken on five new aircraft since Vietnam (F-15, F-16, A-10, KC-10 and B-1) for which we have no combat experience to relate to when the need arises. The exercises that we put units through on a recurring basis are much more realistic and intense than in the past, but no peacetime scenario can equate to the realm of war. There is no simulated substitute for personal experience under fire when aircraft come back with real battle damage (and some don't come back) and the turn-around operations may be frustrated by the incoming rounds/rockets/bombs of the

opposing forces. Certainly we prefer to avoid such a situation, but on the other hand our ultimate responsibility is to be prepared to fight and win if peaceful diplomatic efforts fail to preserve our freedom.

The purpose of this paper is to present a plausible solution to the training dilemma. One that will somehow transfer the seasoned wisdom of our present combat experienced senior maintenance officers to our young maintenance warriors who will be in key leadership positions during future conflicts. What follows may not be revolutionary, but my research led me to the conclusion that the answer must somehow lie within the environment of the great debate of leadership versus management that has confounded academicians and influential people, both military and civilian, for most of this century.

## CHAPTER II

### THE NATURE OF THE PROBLEM

Some five years ago, I responded to the call for help while attending Air Command and Staff College and researched the adequacy of the technical training courses provided through Air Training Command for Aircraft and Munitions Maintenance Officers. My report, "Maintenance Officer Technical Training - A Time for Change," recommended addition of some munitions courses to the basic aircraft maintenance course. As a more long term improvement, I suggested consolidation of the basic maintenance and munitions courses with the provision that specialized follow-on courses would be developed for those officers selected to fill positions where unique expertise and knowledge were required. Subsequent to my study, the USAF Occupational Measurement Center found that "differences in tasks performed by aircraft maintainers in AFR 66-1 and those performed by aircraft maintainers in AFR 66-5 were negligible," which was interpreted as justification to continue a single training program to support our present dual management policies. (1:40)

At this point, no action has been taken to dismantle the separate basic courses in favor of one consolidated course, but I submit that my suggestion still warrants consideration. When you combine munitions and aircraft

maintenance officer authorizations in the grade of lieutenant and captain, there is a one-to-one relationship between the Tactical Air Forces and all other major command authorizations. In other words, there is one AFR 66-5 position for every AFR 66-1 authorization. This fact, coupled with the 25 percent proportion of overseas maintenance officer assignments, provides some logic to the need for initial basic training in both aircraft and munitions maintenance. The chances are very high that one will be exposed to both before he or she has the opportunity to return to Chanute AFB or Lowry AFB for additional cross-training or specialized training. In 1980, approximately 25 percent of munitions officers and 13 percent of aircraft maintenance officers indicated they were assigned duties in the opposite career field while junior officers. Less than five percent of non-fighter respondents indicated cross utilization. (1:52-54)

Regardless of what specific subjects are taught during the basic courses, the technical schools can only provide effective academic training in areas common to the majority of Air Force assignments. Hands on aircraft practical expertise and leadership/management experience can only be acquired on-the-job. This paper addresses what might be called continuation training from the perspective of the recipient. In other words, the continuous training that each officer should receive from the moment he arrives

at his first operational assignment until he completes his farewell address to the troops during his or her retirement ceremony. If one broadens his perspective and places continuation training under the broader category of leadership development, it is easier to visualize an ongoing process that has no end in a dynamic environment such as aircraft maintenance.

Research done by Captains Flanigan and Little found no statistical significance to the hypothesis that lack of proper preparation to assume the duties of an aircraft maintenance officer was related to company grade officer turnover. However, several write-in comments referenced dissatisfaction with supervisor involvement and technical competence. The composite company grade maintenance officer, according to their study, sees the ideal supervisor as "hardworking, technically qualified, supportive of subordinates' decisions, and possessing leadership qualities and ability to deal with people." (12:115-122) An earlier study done by Major David Reed found training to be the third most important factor influencing performance of maintenance officers following "selection of key personnel" and "introduction of change," respectively. He also noted strong negative responses relative to useful application of technical training from junior officers with field grade officers indicating less negativism as they assumed jobs with broader responsibility. (24:21,98) When compared to



later studies, it appears that the technical training problem has been adequately resolved but something is still missing from the unit level perspective.

Much of the dialogue concerning deficiencies in the capability and performance of maintenance officers documented in Inspector General reports, research reports, TIG Brief articles, various logistics publications, letters between senior commanders and staff agencies, conference minutes, etc., is very similar to the dialogue common to the myriad of articles and books on leadership and management. The general theme common to both areas of study is that we have gone through the era of scientific experimentation with heavy emphasis on management principles and controls eventually arriving at the conclusion that it is people who make the difference between success and failure. Current best seller books seem to be focusing on what makes the winners successful over the long haul with the common answer relating to basic principles of leadership and how the leaders relate to their followers.

### CHAPTER III

#### TODAY'S MENTORS PRODUCE TOMORROW'S LEADERS

Dr. Richard I. Lester summed up the current status of the leadership versus management debate when he commented on the interchangeability of the words management and leadership in two recent best sellers "The One Minute Manager" and "Putting the One Minute Manager to Work":

One-minute management challenges people to get out of their own way. . . . The concept holds that people must have the daring to accept themselves as a bundle of possibilities and undertake the process of making the most of their best. . . . Wise managers. . . are always willing to share, grow, and develop. . . seek constructive change. . . challenge our maturity and promote personal and professional development. . . . In applying this idea, the manager gives little advice, provides options, and always stresses the need for all personnel to keep growing in concentric circles so that there is a systemic multiplier effect on whomever they contact. (18:113)

It is interesting that the third title of the one-minute manager series is "Leadership and the One-Minute Manager". Obviously the importance of leadership is emphasized and some of the highlights follow:

When you think [of an organizational] pyramid. . . the assumption is that everyone works for the person above them on the organizational ladder. . . . I prefer to turn the pyramid upside down so that the top managers are on the bottom. . . there is a subtle, but powerful twist in who is responsible and who should be responsible to whom. . . . Competence is a function of knowledge and skills, which can be gained from education, training, and/or experience. . . . Leaders need to do what the people they supervise can't do for themselves at the present moment. (8:17,49 and 69)

The idea is repetitious of many management and leadership theories but the bottom line recommendation on how to be successful is get back to basics. One-on-one personal interaction and communication with renewed emphasis on coaching subordinates until they are capable and confident enough to emulate the values and philosophy of senior leadership is the common theme of current books. Realizing that no two people are identical, the leader must be flexible and adapt his approach to the personality and development level of the subordinate. In military situations "debates" are usually decided in favor of the boss, but there would be fewer confrontation situations if supervisors did a better job of sharing their values and experiences with their people.

As Henry Kissinger said: "The task of the leader is to get his people from where they are to where they have not been." (23:282) This is particularly relevant for the young maintenance officers. Deputy Commanders for Maintenance and Squadron Commanders should devote at least 25 percent of their wandering around leadership/management time to their developing maintenance officers to enhance their feel for the business of aircraft maintenance. The amount of time spent in the shops and on the flightline varies from one leader to another, but the junior maintenance officers need and deserve the first quarter of this invaluable leadership commodity, regardless of how many

or how few hours per month. Admiral Zumwalt explained his philosophy on maximizing productivity when he said:

What I tried hardest to do was ensure every officer and man on ship not only knew what we were about, not only why we were doing each tactical evolution, however onerous, but also managed to understand enough about how it all fitted together that he could begin to experience some of the fun and challenge that those of us in the top slots were having. (23:236)

In many cases senior leaders tend to delegate too much of their mentor responsibility to their staff and mid level supervisors assuming that their philosophy and personal expectations based upon their experiences will somehow be assimilated down the line.

One reason for the reluctance of many senior maintenance leaders to share their experience with their subordinate officers might be their own lack of hands on experience. The 1980 Occupational Survey Report showed 32 percent of 204 responding maintenance squadron commanders and 70 percent of the 50 Deputy Commander for Maintenance respondents were rated officers. These two positions were unanimously identified as the most influential and prestigious jobs for a maintenance officer, yet 40 percent (the rated officers) had very limited maintenance experience and maintenance management training. In fact, 24 of the respondents had not attended any maintenance course. It is very difficult to perform the role of mentor or coach when one is learning the ropes himself. (1:27,38,A1,A4)

Another area that may somewhat inhibit a dynamic mentor environment is the ratio of prior enlisted service officers in the present maintenance officer population. Fifty percent of assigned Lieutenants and Captains have prior service with 31 percent of the total population having more than eight years prior service. (17:3-5) By the time they are promoted to Major, over one-half of our experienced middle leadership will be eligible for retirement. Past experience shows 50 percent of prior enlisted officers retire as soon as they reach 10 years commissioned service. (17:4-3) In January 1986, there were 674 maintenance officers with over 8 years enlisted service and 312 with 10 or more years commissioned service. (13) This is a dramatic indication of how fragile our experience base is in terms of projected longevity. In some ways prior enlisted service compliments the experience equation from the technical perspective. However, several studies and recent articles indicate some prior service officers have difficulty making the transition from NCO to Officer and specialist to general manager/leader. In my experience, I found about 50 percent of prior enlisted officers encountered some transition problems. This transition dilemma merely provides another challenge for today's mentors because they must provide flexible training programs to match a wide variety of trainee personalities and backgrounds. Today's maintenance officers and today's

flightline environment provide a dynamic laboratory for leadership and management practitioners.

Approximately 78 percent of aircraft maintenance and 68 percent of munitions officers perceive their prior training to be useful in jobs at or below wing level.

(1:51-53) The lower rate for munitions officers may be related to their higher utilization in aircraft maintenance jobs without the benefit of associated technical/management training. Yet, "The Exceptional Release" (Maintenance Officer Association (MOA) bimonthly newsletter) frequently contains articles by junior maintenance officers who are not satisfied with their overall preparation to handle the challenges of our present maintenance environment. The consensus of the junior officer panel at the 1985 MOA convention was:

Senior maintenance officers are not providing the direction, guidance, mentorship, and/or training that junior officers are expecting. . . . strong need for commanders and maintenance supervisors to make time for their junior officers. . . . want to be part of the team. . . need to know what "old heads" want or expect. . . . need more on-the-job training by experienced maintenance officers. . . no one ever explained the rules of engagement. . . biggest problem was lack of tutoring in corporate Air Force and unit concerns. (21:6-7)

The members of MOA make up 25 percent of the total maintenance officer population so they provide a reasonable cross section of their peers. Their comments imply that something is missing in the training equation which I submit

is simply the mentor/coach element of good old fashioned leadership.

During the March 1984 MOA convention, Lt Gen Marquez (HQ USAF/LE) said:

We need more maintenance leaders and maintenance managers, not more technicians. We know when the equipment is broken and we know how to fix it. What we need to ensure is that we have maintenance leaders who can effect weapon system fixes through equipping, training and sustaining their technician forces. (21:9)

Brig Gen Gillis (ATC/LG) encouraged maintainers to become students of history in his convention address entitled "No One Does the Hard Things Anymore."

Lt Gen Kelley (Vice Commander, HQ TAC) in a letter to Lt Gen Marquez dated 28 Nov 84 said:

Twelve of our DCMs, or fifty percent, have operational backgrounds; three-quarters of these have less than four years of maintenance experience. I am concerned that we are not getting the talent commensurate with the demands and challenges required of one of our most responsible senior officer positions. I believe a DCM tour is as important in the development of our senior maintenance officers as command of a wing is on the operational side. (10:1)

The need for more experienced/better trained maintenance officers is well documented and key managers are aware of the potential experience exodus via retirement associated with the present manning mix. The senior leaders are aware of the problem and are working hard to improve the maintenance leadership environment. Much has been done in recent years and few maintainers can say their lot is not better today than it was five to ten years ago. The time

has come to dust off your library of leadership and management books or visit your base library to rekindle your leadership spirit. Several recent books have some refreshing views on the subject of leadership which seems to be the missing pillar necessary to build the ultimate maintenance officer.

Margaret Higginson and Thomas Quick, in their book "The Ambitious Women's Guide to a Successful Career," define coaching as the discussions between manager and subordinate that contribute to the development and improved effectiveness of the subordinate. They go on to say coaching is one of the most important functions of a manager but is also one of the most neglected activities. This neglect can relate to many understandable reasons depending on the perspective of the coach and his/her position in the organization. Successful coaching may result in loss of top subordinates to other sections, or a peer with less experience gaining from your advice and rising above you, or you could lose your present job because you excelled as a mentor for your successor. A fear of opening up to subordinates may stymie<sup>ie</sup> effective coaching, but a manager who has the best interest of their organization in mind must rise above such fears to reap the full potential of those with less experience and limited corporate knowledge.

(10:124-126)



In "A Passion For Excellence" coaching is defined as "face-to-face leadership that pulls together people with diverse backgrounds, talents, experiences and interests." It is that ongoing interaction between leader and follower that encourages the follower to accept added responsibility and strive for continued self improvement while simultaneously becoming a more productive contributor to the mission of their organization. Tom Peters and Nancy Austin cite five vital aspects of coaching: visibility, listening, limit setting, value shaping and skill stretching. They provide some useful insight into the coaching arena:

Coaching. . . is the process that enables others to self . . . is counting on people to use their own special skills. . . is a full time endeavor. . . is tough minded and demanding. . . is how things work around here. . . is remembering that in many cases experience is still the best teacher. . . is creating winners who can participate as full partners. . . is being the rock of stability during the darkest hour. . . is ongoing unobtrusive leadership. . . is not a simple rubric. Done-well, it is the best a leader can give.  
(4:324-377)

Craig Hickman and Michael Silva address the role of the mentor in their book "Creating Excellence." Their theme is particularly significant for military organizations: "Great organizations owe their greatness to a few individuals who mastered leadership skills and passed those skills on to their successor generations." They also remind us that:

Individuals, not organizations, create excellence. . . those with unique skills lead others along the path to excellence. . . the successful mentor makes sure he

passes his gift for strategy and flair for building a strong corporate culture on to future leaders. . . the challenge is to become both visionary and realistic, sensitive and demanding, innovative and practical. . . develop a sense of enthusiasm to be on the leading edge.

They identify six essential skills that dynamic future managers must learn: creative insight, sensitivity, vision, versatility, focus and patience. In our case, I would add a seventh virtue--courage to start what one may not see come to fruition because of our transient nature. (16:23-34)

The recognition of a need for leadership development is not restricted to popular "best seller" authors who primarily rely on the industrial sector for their research base. The new Air Force Combat Support Doctrine will contain some salient points:

A well trained and tested aerospace force is better able to endure in combat. The maturation process takes the military resources from the acquisition process and prepares them for combat as part of an aerospace system or force. For people, maturation is an ongoing process that stretches over entire Air Force careers. This process is meant to instill the will--the warfighting spirit--as well as the skills of a warrior as people are trained, educated, and indoctrinated to lead and manage at the unit, theater, and global levels.

In the most difficult of all human endeavors--preparing for and engaging in war--leadership offers the path to victory. Heroic battlefield leadership has been the hallmark of American fighting forces. But, in an age of nuclear weapons and highly mobile and lethal conventional forces, the leadership exercised in preparing aerospace forces for war may prove to be decisive. Peacetime organizations can only remain dynamic and viable through personal leadership; groups are less capable of managing organizational change because group action demands consensus and avoids risk taking. Thus, the imagination and creativity of the individual leader can bring vision to an organization and motivate people to accomplish extraordinary deeds. (9:16-17)

Both the problem and the potential solution are illusive in nature because both hinge on the mystic power of positive leadership which influences individual personalities and attitudes. The academic world has recently accepted the proposition that leadership and management are not as opposite as black and white but two pillars that are consistently present in every success story. Senior maintenance officers must accept the essential need for a positive mentor/coach relationship to enhance the survival rate and daily nurturing of their assigned young maintenance warriors. The book should be full of ideas on how to be a successful leader. Now is the time to turn the words into action.

## CHAPTER IV

### CONCLUSION

Has the leader the right to mold and shape? Of what use is aging, experience, and wisdom if not to be the lesson for those who are younger? Of what use is pain if not to teach others to avoid it? The leader not only has the right; if he is a leader, he has the obligation.

--Harry Levinson, "The Exceptional Executive" (4:324)

General Gabriel places the responsibility for effective leadership on everyone, not just senior officers and NCO's. He challenges Air Force personnel to accept the special responsibility of developing the leaders who will carry us into the 21st Century remembering that the real strength of the Air Force is our people. (14:2)

To fulfill this challenge, we must remove the shackles that have somehow prevented us from exercising the full range of our leadership potential especially in the area of coaching those with less leadership experience and maintenance management know how. There are a multitude of reference sources on the art of leadership and science of management, but as you reach out in search of the perfect role model or guru, make sure you grab hold of something that matches your style. There are no guarantees but the option of not stepping up to the challenge has a much gloomier future than the option of giving it your best effort.

Robert Heller in his book "The Supermanagers" says "things have to be made to happen in the way you want them

to. Without management, without the intervention of organized willpower, the desired result simply cannot be obtained." (15:386-388) Today's experienced leaders can and must play a positive and active mentor/coach role in the training and leadership/management development of tomorrow's supermanagers. Most of today's "old heads" may not be on the flightline when tomorrow's maintenance officers get their first taste of combat. What we share with them today may very well determine the success of their performance when they are put to the ultimate tests. The immediate return on your investment of time, effort and patience will be increased productivity in your unit with the gradual realization that they are doing more and you are doing less--or at least you have more time to do the things you always wanted to do but never had the time.

Being a dynamic leader and successful manager is not easy to define nor easy to do--but no job worth doing is easy. As a mentor, you will have ample opportunity to make an indelible mark on the future of aircraft maintenance. Take some time to smell the roses, dust off a few war stories and share your experience as a legacy to a valiant profession. Help build a team of hard charging highly polished maintenance officers who are ready, willing and able to do the hard things today and in the future.

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